DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of claims 1-29 in the reply filed on September 28, 2009 is acknowledged.

Claim 30 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on September 28, 2009.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

1. Claims 1-3, 10 and 16 are objected to because of the following informalities:
   - claim 1 contains misspellings of the words "passivating", "monopropylene", and "and" in the 4th and 7th lines of the claim;
   - claims 2 and 3 each contain a misspelling of the word "as" in the second line of their respective claims;

- claim 10 is missing the word “stagnation” in the second line of the claim; and
- claim 16 has an “and/or” clause in which the “O” is capitalized.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 4, 8, 11, 19 and 21-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 4 and 22, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Additionally, claim 4 recites the limitation "wherein surface contaminants" in the second line of the claim. However, there is insufficient antecedent basis for this limitation in the claim. Applicant should insert the words “the” or “said” before the word surface so as to clearly refer to the aforementioned surface contaminants.

Claim 8 recites the limitation "said electrochemical process" in the second and third lines of the claim. However, there is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation “the chemical and/or electrolyte solution” in the third and fourth lines of the claim. However, there is insufficient antecedent basis for this limitation in the claim.

Claim 19 recites the limitation "said passivating step voltage" in the second and third lines of the claim. However, there is insufficient antecedent basis for this limitation in the claim.

Claim 21 recites the limitation "said inorganic material coating or sealer" in the second line of the claim. However, there is insufficient antecedent basis for this limitation in the claim. The examiner is treating claim 21 as though it depended from claim 20 since this appears to have been applicant’s intent.

Finally, claim 23 recites the limitation "said inorganic material coating or sealer step" in the third line of the claim. However, there is insufficient antecedent basis for this limitation in the claim. The examiner is treating claim 23 as though it depended from claim 20 since this appears to have been applicant’s intent.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-11, 17 and 19-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Page (U.S. Pat. No. 3,222,266) (hereinafter referred to as "PAGE").

Regarding claim 1, PAGE teaches a method of polishing and/or brightening a magnesium or magnesium alloy surface (see col. 7 lines 30-32 and table 1 showing the use of a magnesium containing alloy) composing the steps of:

- polishing the surface (see col. 7 lines 34-40 teaching the placing of the alloy surface into a brightening solution); and
- passivating the polished surface (see col. 7 lines 44-47 teaching the anodizing of the brightened surface);
    - wherein the polishing step is carried out by a chemical and/or electrochemical polish while the surface is immersed in a polishing composition comprising nitric acid (see col. 7 lines 34-40 teaching the brightening solution containing nitric acid).

Please note, the examiner is interpreting the word "magnesium alloy" to apply to any alloy comprising magnesium as a constituent. Additionally, the examiner is interpreting the transitional phrase "composing the steps of" to be inclusive or open-ended in accordance with MPEP § 2111.03.

Regarding claim 2, PAGE teaches the method of polishing and/or brightening a magnesium or magnesium alloy surface wherein the method further comprises an initial step of pre-treating the surface to remove surface contaminants (see col. 7 lines 32-34).

Regarding claims 3 and 5, PAGE teaches the method of polishing and/or brightening a magnesium or magnesium alloy surface wherein the pre-treating steps comprises chemically etching the surface and/or degreasing the surface (see col. 7 lines 32-34 teaching washing the alloy surface with an alkaline cleaner which would act to degrease the surface).

Please note, claim 5 recites additional limitations that further limit the optional chemical etching limitation of claim 3. Consequently, since PAGE teaches the other pre-treating step, i.e. the degreasing pre-treatment, claim 5 is still considered to be anticipated by PAGE.

Regarding claim 4, PAGE teaches the method of polishing and/or brightening a magnesium or magnesium alloy surface wherein the surface contaminants are removed during the pre-treatment step by contacting the surface with one or more degreasing components (see col. 7 lines 32-34 teaching washing the alloy surface with an alkaline cleaner which are known in the art to be “degreasing components”).

Regarding claim 6, PAGE teaches the method of polishing and/or brightening a magnesium or magnesium alloy surface wherein the chemical and/or electrochemical polish removes surface layers and/or reduces microscopic high points from the surface (see col. 7 lines 34-40 teaching the use of a chemical brightening process that would act to brighten the surface of the metal as claimed).

Regarding claims 7-10, PAGE teaches the method of polishing and/or brightening a magnesium or magnesium alloy surface wherein a chemical polish is used (see the discussion above relating to claim 1). Furthermore, all the limitations of claims 7-10 act to further limit the other claimed polishing technique, i.e. electrochemical polishing, without requiring this technique to be used. As a result, claims 7-10 are still considered to be anticipated by PAGE as outlined previously with respect to claim 1.

Regarding claim 11, PAGE teaches the method of polishing and/or brightening a magnesium or magnesium alloy surface wherein the polishing step is followed by an intermediary wash removing at least some of the chemical and/or electrolyte solution from the surface (see col. 7 lines 42-43).

Regarding claim 17, PAGE teaches the method of polishing and/or brightening a magnesium or magnesium alloy surface wherein the passivating step provides a substantially corrosion resistant and/or water insoluble surface coating or film (see col. 7 lines 44-47 teaching the anodizing of the chemically brightened surface which would provide an oxide layer that is both substantially corrosion resistant and water insoluble).

Regarding claim 19, PAGE teaches the method of polishing and/or brightening a magnesium or magnesium alloy surface wherein the passivating step voltage is varied to alter the substantially corrosion resistant and/or water insoluble surface coating or film thickness (see col. 7 lines 44-47 teaching the use of an anodizing process of which

it is well known by one of ordinary skill in the art to control the thickness of the anodized layer by adjusting the anodizing voltage).

Regarding claim 20, PAGE teaches the method of polishing and/or brightening a magnesium or magnesium alloy surface wherein an inorganic material coating or sealer is applied to the substantially corrosion resistant and/or water insoluble surface coating or film (see col. 7 lines 55-67 and col. 3 lines 50-57 teaching the application of an enamel coating onto the anodized surface comprising an inorganic material).

Regarding claim 21, PAGE teaches the method of polishing and/or brightening a magnesium or magnesium alloy surface wherein the inorganic material coating or sealer is substantially transparent and/or substantially provides corrosion protection and/or at least provides some protection from mechanically induced damage (see col. 7 lines 55-67 and col. 3 lines 50-57 teaching the application of an enamel layer that would at a minimum to provide some protection from mechanically induced damage).

Regarding claim 22, PAGE teaches the method of polishing and/or brightening a magnesium or magnesium alloy surface wherein the inorganic material coating or sealer is a silicon-based composition (see col. 3 lines 50-57 teaching the enamel composition comprising SiO_2, i.e. a silicon-based composition).

Regarding claim 23, PAGE teaches the method of polishing and/or brightening a magnesium or magnesium alloy surface wherein the passivating step and/or the inorganic material coating or sealer step is followed by a surface drying step (see col. 7 lines 51-52 teaching a drying step after the passivating step).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 11 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gray et al., "Protective Coatings on Magnesium and Its Alloys—a Critical Review" *Journal of Alloys and Compounds* 336, pages 88-113 (2002) (hereinafter referred to as "GRAY") in view of Greene (U.S. Pat. No. 3,766,030) (hereinafter referred to as "GREENE").

Regarding claim 1, GRAY teaches a method of polishing and/or brightening a magnesium or magnesium alloy surface (see page 89 and 98 teaching the anodizing of magnesium or a magnesium alloy) composing the steps of:

- polishing the surface (see page 98 teaching the polishing of the metal surface prior to anodizing); and
- passivating the polished surface (see page 98 teaching the anodizing of the polished metal surface which would passivated the metal surface by providing an oxide layer on the outer surface of the metal substrate);
    - wherein the polishing step is carried out by a chemical and/or electrochemical polish while the surface is immersed in a polishing

composition (see page 98 teaching the electro-brightening of the metal surface prior to anodizing).

GRAY, however, does not explicitly teach the composition of the polishing solution comprising phosphoric acid.

However, GREENE teaches a method for electro-polishing magnesium where the electrolyte solution comprises phosphoric acid (see col. 2 lines 57-68 and col. 4 lines 9-16 teaching the use of phosphoric acid for the electro-polishing of magnesium).

Consequently, as shown by GREENE, a person of ordinary skill in the art would accordingly have recognized the use of phosphoric acid in the polishing solution when electro-polishing a magnesium metal surface.

Furthermore, it would have been obvious to one of ordinary skill in the art to use an electrolyte solution like that taught in GREENE for the polishing step of GRAY since GREENE discloses the use of the electrolyte for polishing the surface of magnesium metal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use the polishing solution of GREENE containing phosphoric acid in the polishing step of GRAY as claimed.

Regarding claim 11, GRAY does not explicitly teach the polishing step being followed by an intermediary wash step removing at least some of the chemical and/or electrolyte solution from the surface.

However, it would have been obvious to one of ordinary skill in the art to have some type of intermediate wash between the polishing step and the anodizing step in order to avoid contamination of the anodizing electrolyte solution.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use an intermediary wash step as claimed.

Regarding claim 17, GRAY teaches the method of polishing and/or brightening a magnesium or magnesium alloy surface wherein the passivating step provides a substantially corrosion resistant and/or water insoluble surface coating or film (see page 98 teaching the anodizing of the polished surface which would provide an oxide layer that is both substantially corrosion resistant and water insoluble).

5. Claims 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over GRAY in view of GREENE as applied to claims 1 and 11 above, and further in view of Higuchi et al., (U.S. Pat. No. 6,335,099) (hereinafter referred to as “HIGUCHI”) with evidence from Macculloch et al., (W.I.P.O. Pub. No. 98/42895) (hereinafter referred to as “MACCULLOCH”) for claim 12 only and J. E. Hillis, “Surface Engineering of Magnesium Alloys” ASM Handbook, Surface Engineering vol. 5, pages 819-834 (1994) (hereinafter referred to as “HILLIS”) for claim 16 only.

Regarding claim 12, GRAY does not explicitly teach the intermediary wash composition containing ethylene glycol.

However, HIGUICHI teaches the pre-treatment of a magnesium article prior to being anodized but after the polishing step, i.e. the mirror-finishing treatment, which includes washing of the polished surface with both a surfactant and an alkali (see col. 3 lines 18-32). Moreover, as evidenced by Macculloch, it is well known in the art that ethylene glycol is a common surfactant or wetting agent (see page 19 lines 14-15 teaching the use of ethylene glycol as a wetting agent during the application of a dye in an anodized magnesium or magnesium alloy surface).

Consequently, as shown by HIGUICHI, a person of ordinary skill in the art would accordingly have recognized the use of an intermediary wash of a surfactant, such as ethylene glycol, and an alkali prior to anodizing of the surface in order to not impair the gloss while still effectively rinsing the surface (see col. 3 lines 26-30 teaching this pre-treatment washing not causing any damage to the highly polished magnesium surface).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use the pre-treatment washing steps of HIGUICHI to wash the surface after polishing

Regarding claims 13-14, as noted above, HIGUICHI teaches the polishing step and the intermediary wash being followed by an alkaline wash (see col. 3 lines 18-32 and discussion above with respect to claim 12).

Regarding claim 15, HIGUICHI teaches the alkaline wash which would inherently be capable of substantially neutralizes acids as claimed (see col. 3 lines 30-32).

Regarding claim 16, as noted previously, HIGUICHI teaches the use of an alkaline wash (see col. 3 lines 30-32). Furthermore, while HIGUICHI does not explicitly state the use of sodium hydroxide, as evidenced by HILLIS, the use of sodium hydroxide for the alkaline wash is routine in the art (see pages 820-821 teaching the use of a sodium hydroxide solution for the alkaline wash when treating magnesium surfaces).

6. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over GRAY as applied to claim 1 above and further in view of Joesten (U.S. Pat. No. 5,683,522) (hereinafter referred to as "JOESTEN").

Regarding claim 18, GRAY does not teach the method of polishing and/or brightening a magnesium or magnesium alloy surface wherein the substantially corrosion resistant and/or water insoluble surface coating or film is a phosphate salt coating or film. Instead, as noted above, GRAY teaches the application of an oxide coating or film (see page 98).

However, JOESTEN teaches a method of providing a corrosion resistant phosphate salt coating or film (see col. 2 lines 9-14 teaching the application of a corrosion resistant phosphate coating onto a magnesium or magnesium alloy surface).

Moreover, JOESTEN teaches the benefit of providing a phosphate coating being that it provides a more environmentally friendly coating by avoiding the use of chromate-based coatings (see col. 1 lines 31-41). Additionally, JOESTEN teaches the benefit of

using a phosphate based coating over an anodizing method in that it can provide for a more even and uniform coating (see col. 1 lines 42-67 teaching various disadvantages of anodizing including non-uniform oxide coatings on complex shaped pieces).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to instead of applying an oxide layer through an anodizing process to the magnesium article, rather apply a phosphate based coating as taught by JOESTEN, in order to obtain a method as claimed.

7. Claims 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over GRAY as applied to claim 1 above, and further in view of Yoshifumi et al., (J.P. Pub. No. 2000-064057) with reference to the provided machine translation (hereinafter referred to as “YOSHIFUMI”).

Regarding claim 24-28, GRAY does not teach the method of polishing and/or brightening a magnesium or magnesium alloy surface including the pre-treatment steps as claimed.

However, YOSHIFUMI teaches a surface treatment method for a magnesium or magnesium alloy surface including the pre-treatment steps of: (a) immersing the surface in an iron based solution; (b) activating the surface with the iron based solution wherein the iron based solution is reduced to thereby deposit iron on the surface; (c) etching the surface with an etch composition to modify the activated surface layer (see ¶13 teaching the treated surface being activated and etched by a solution containing ferric

chloride); (d) stripping iron deposits from the surface with an iron removal composition (¶14 teaching the surface control step); and (e) washing the surface to substantially remove compositions remaining on the surface (see ¶14 teaching rinsing the treated surface).

Additionally, YOSHIFUMI teaches the activator solution, the etch composition and the iron removal composition containing ferric chloride and nitric acid which is followed by a washing step (see ¶13 and ¶14).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRYAN D. RIPA whose telephone number is 571-270-7875. The examiner can normally be reached on Monday to Friday, 9:00 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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